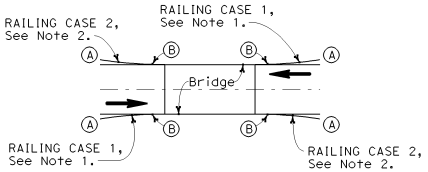
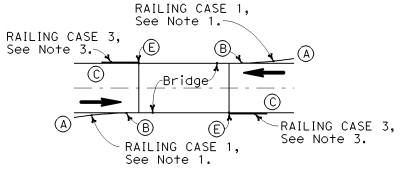
RAILING AT STRUCTURES

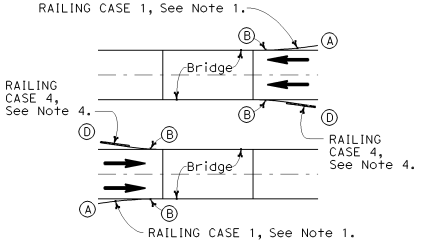
See Notes 10 AND 11



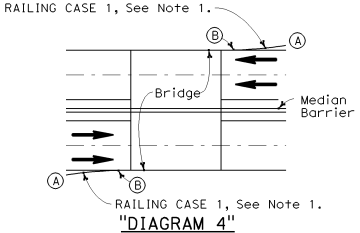
"DIAGRAM 1"
TWO-WAY HIGHWAY BRIDGE ROADBED WIDTH LESS THAN 12 METERS



"DIAGRAM 2"
TWO-WAY HIGHWAY BRIDGE ROADBED WIDTH EQUAL TO OR GREATER THAN 12 METERS



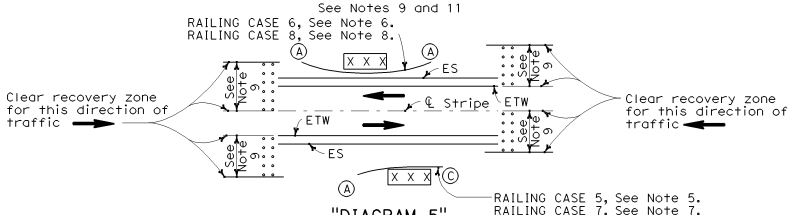
"DIAGRAM 3"
MULTILANE HIGHWAY WITH SEPARATE STRUCTURE FOR EACH DIRECTION OF TRAVEL



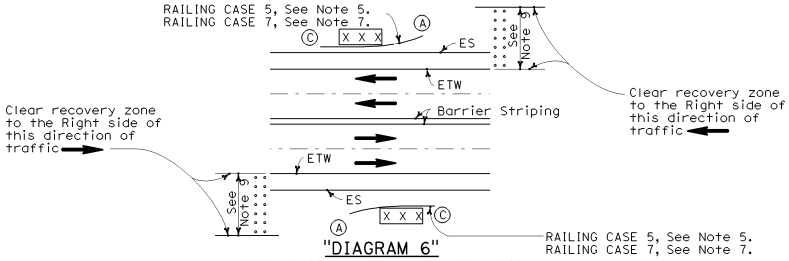
"DIAGRAM 4"
MULTILANE HIGHWAY WITH DECKED MEDIAN ON STRUCTURE

RAILING AT FIXED OBJECTS OR EMBANKMENT INSTALLATIONS

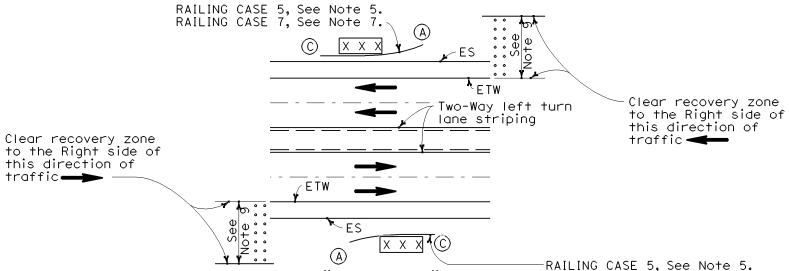
See Notes 9 and 11



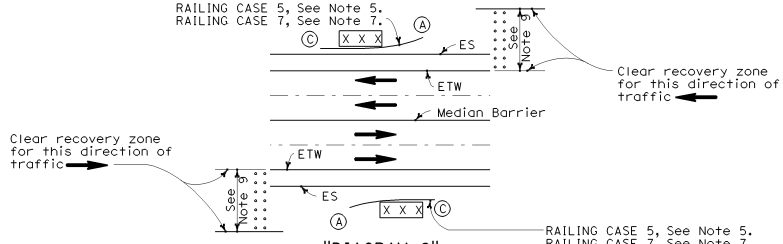
"DIAGRAM 5"
TWO-WAY HIGHWAY



"DIAGRAM 6"
TWO-WAY MULTILANE HIGHWAY WITH BARRIER STRIPING



"DIAGRAM 7"
TWO-WAY MULTILANE HIGHWAY WITH TWO-WAY LEFT TURN LANE STRIPING



"DIAGRAM 8"
TWO-WAY MULTILANE HIGHWAY WITH MEDIAN BARRIER

Caltrans Metric

DIST	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

Ellis K. Hirst
REGISTERED CIVIL ENGINEER

July 1, 2004
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
Ellis K.Hirst
No. C17926
Exp. 6-30-05
CIVIL
STATE OF CALIFORNIA

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NOTES:

1. Where railing is constructed to shield the ends of structures for the conditions shown in RAILING CASE 1 on DIAGRAM Nos. 1, 2, 3 and 4, Layout Types 12A or 12B shown on Standard Plan A77F1 or Layout Type 12C shown on Standard Plan A77F2 are typically used.
2. Where railing is constructed to shield the ends of structures for the conditions shown in RAILING CASE 2 on DIAGRAM No. 1, Layout Types 12AA or 12BB shown on Standard Plan A77F4 or Layout Type 12CC shown on Standard Plan A77F5 are typically used.
3. Where railing is constructed at the ends of structures for the conditions shown in RAILING CASE 3 on DIAGRAM No. 2, Layout Type 12DD shown on Standard Plan A77F5 is typically used.
4. Where railing is constructed to shield the ends of structures for the conditions shown in RAILING CASE 4 on DIAGRAM No.3, Layout Type 12E shown on Standard Plan A77F3 is typically used where median barrier is not constructed. See Standard Plan A77D2 where median barrier is provided.
5. Where construction of railing is recommended to shield embankment slopes for the conditions shown in RAILING CASE 5 on DIAGRAM Nos. 5, 6, 7 and 8, Layout Types 11A, or 11B or 11C shown on Standard Plan A77E1 are typically used.
6. Where construction of railing is recommended to shield embankment slopes for the conditions shown in RAILING CASE 6 on DIAGRAM No. 5, one of the series of Layout Types (11D through 11L) shown on the A77E Series of Standard Plans are typically used. The layout type to be used is dependent on site specific conditions.
7. Where construction of railing is recommended to shield fixed object(s) for the condition shown in RAILING CASE 7 on DIAGRAM Nos. 5, 6, 7 and 8, Layout Types 16A, 16B or 16C shown on Standard Plan A77G3 are typically used.
8. Where construction of railing is recommended to shield fixed objects for the conditions shown in RAILING CASE 8 on DIAGRAM No. 5, one of the series of Layout Types (16D through 16L) shown on Standard Plan A77G Series of Standard Plan are typically used. The layout type to be used is dependent on site specific conditons.
9. Clear recovery zone is 6 m for Conventional Highways and 9 m for Expressways or Freeways.
10. See Standard Plan A77D2 for additional guard railing at structure placement diagrams.
11. These diagrams are not intended to provide geometric design standard guidance. See the Highway Design Manual for this type of guidance.

LEGEND

- (A) Caltrans approved end treatment or buried post end anchor.
- (B) Transition railing with anchorage to structure.
- (C) Railing end anchor assembly.
- (D) Caltrans approved crash cushion or end-treatment.
- (E) Positive anchorage to structure.
- X X X Fixed object(s) or non-recoverable embankment slope.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

METAL BEAM GUARD RAILING AT STRUCTURES, FIXED OBJECTS AND EMBANKMENTS (PLACEMENT DIAGRAMS)

NO SCALE

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

A77D1

2004 Std PLAN A77D1

05-10-04